

# NCST Investigation of the Champlain Towers South Collapse

## Investigation Introduction & Progress

Judith Mitrani-Reiser

*Lead Investigator*

[judith.mitrani-reiser@nist.gov](mailto:judith.mitrani-reiser@nist.gov)

# Background: National Construction Safety Team (NCST) Act

## National Construction Safety Team (NCST)

- The NCST Act was passed in October 2002
- Evaluate hazard/failures events against deployment criteria
- Conduct NCST investigations and studies under various authorities
- Manage onboarding of NCST Advisory Committee (NCST AC) members and NCSTAC meetings
- The NCST AC prepares annual reports to Congress by Jan 1
- NIST prepares annual reports to Congress by Feb 15
- NIST coordinates statutory activities across federal programs related to disasters and failures

## NIST Activities Under the NCST Authority

- Conduct technical investigations of building failures that resulted in loss of life or the potential for loss of life, using engineering and scientific tools
- Conduct technical investigations of the emergency response and evacuation activities and communications, using engineering and scientific tools
- Based on the results of investigations, make recommendations for changes to building codes, standards, practices to improve safety
- After the completion of investigations, draft and vote on proposals for changes to building codes, standards, practices

## What NIST Cannot Do Under its Authorities

- NIST cannot make/require changes to building codes, standards, or practices
- NIST cannot inspect for or certify safety of existing/new buildings or sites
- NIST cannot approve plans for renovations to existing buildings or sites
- NIST cannot pass laws (e.g., regarding building design, inspection, approval)
- NIST cannot conduct criminal investigations or find fault associated with building failures, or prosecute, or punish any parties

# CTS Investigation: Previous NCST AC Update



- Collected Physical Evidence for 2.5 months
- Subsurface Investigation
- Non-Destructive Testing
- Measure Ground Water
- Created Investigation Plan
- Established Team Leaders
- Agreement w/ USACE

- Named New Project Leader
- Took Custody of Evidence
- Baseline Structural Model
- Developed Evidence Access Plans and Timeline
- Cooperated with Local Authorities to Address EPA's Asbestos Requirements

- Developed Requirements for Hauling
- Executed NSF, BuRec, FBI Agreements
- Completed Wave Propagation Tests
- Received Court Transferred Specimens and Test Records
- Updated Failure Hypotheses and Collapse Timeline
- Developed FY23 Milestones



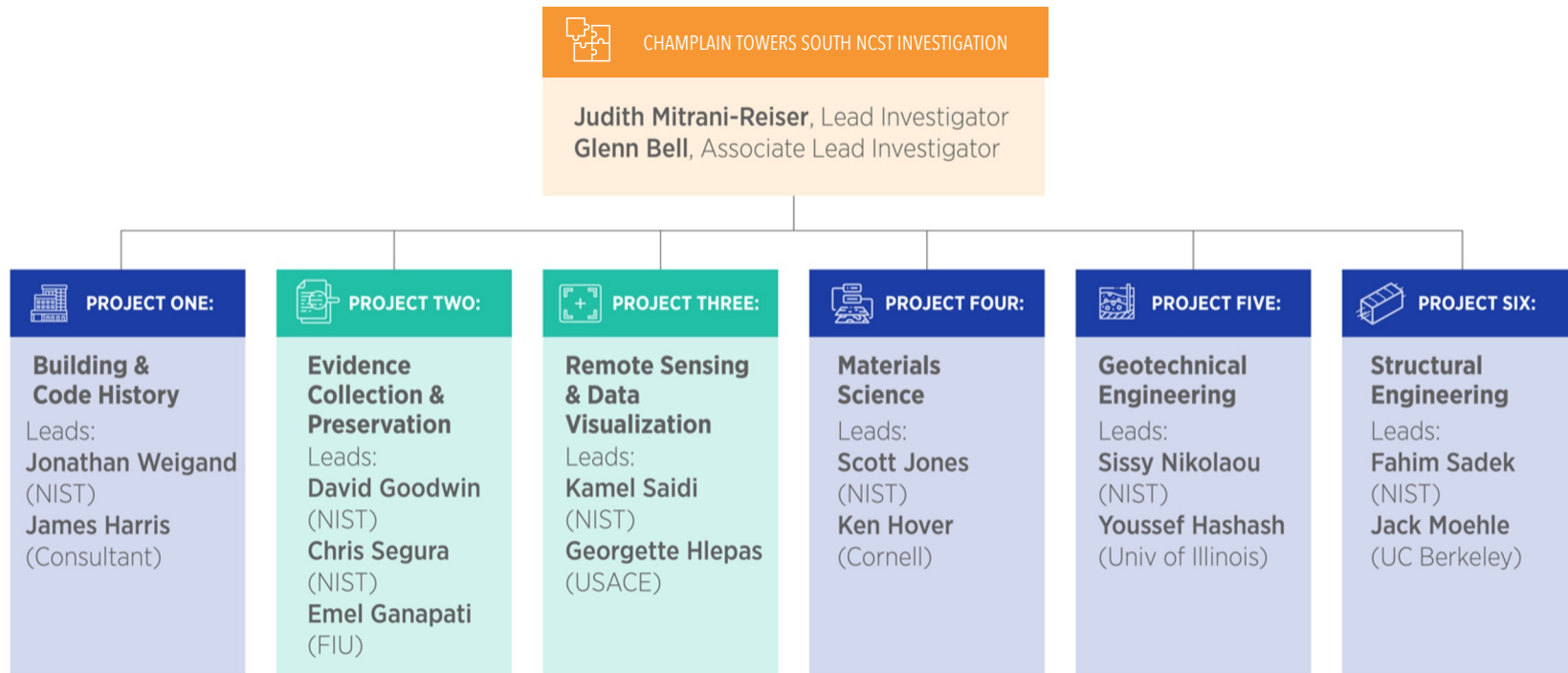
- Refined Failure Hypotheses
- Refined Collapse Timeline
- Received Funding
- Developed FY22 Milestones
- Detailed Measurements
- Launched Interviews
- Held NCST AC meeting

- Scanned Warehouse
- Scanned Physical Evidence
- Developed a 3D Model
- Initiated Corrosion Studies
- Developed Invasive Testing Plans
- Developed Structural Testing Plans
- Developed Collapse Model
- Attended Family Meeting

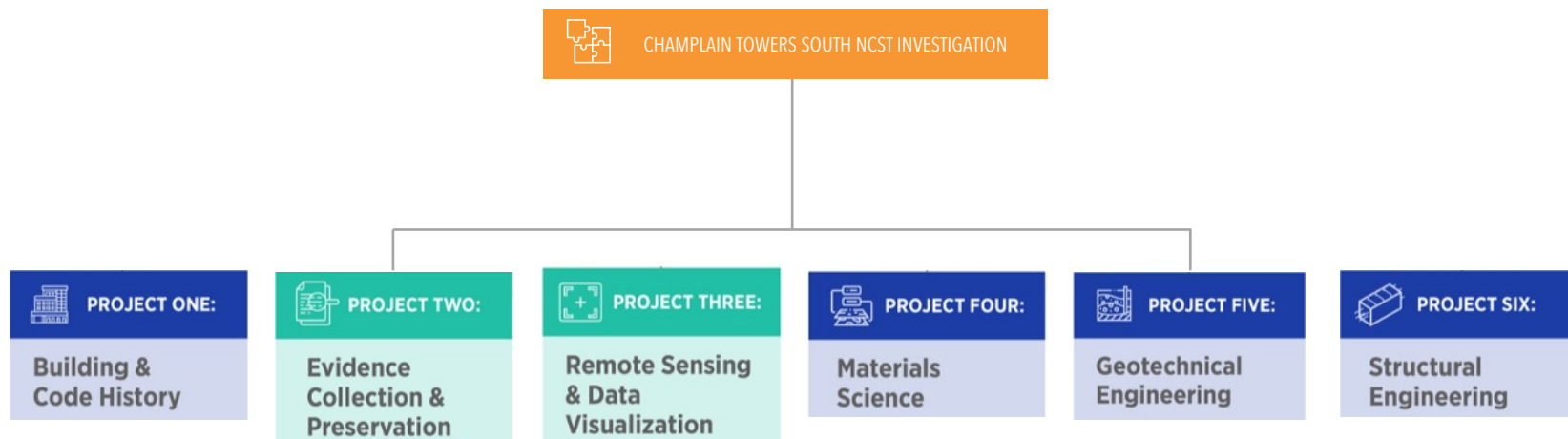
# Organization of CTS Investigation



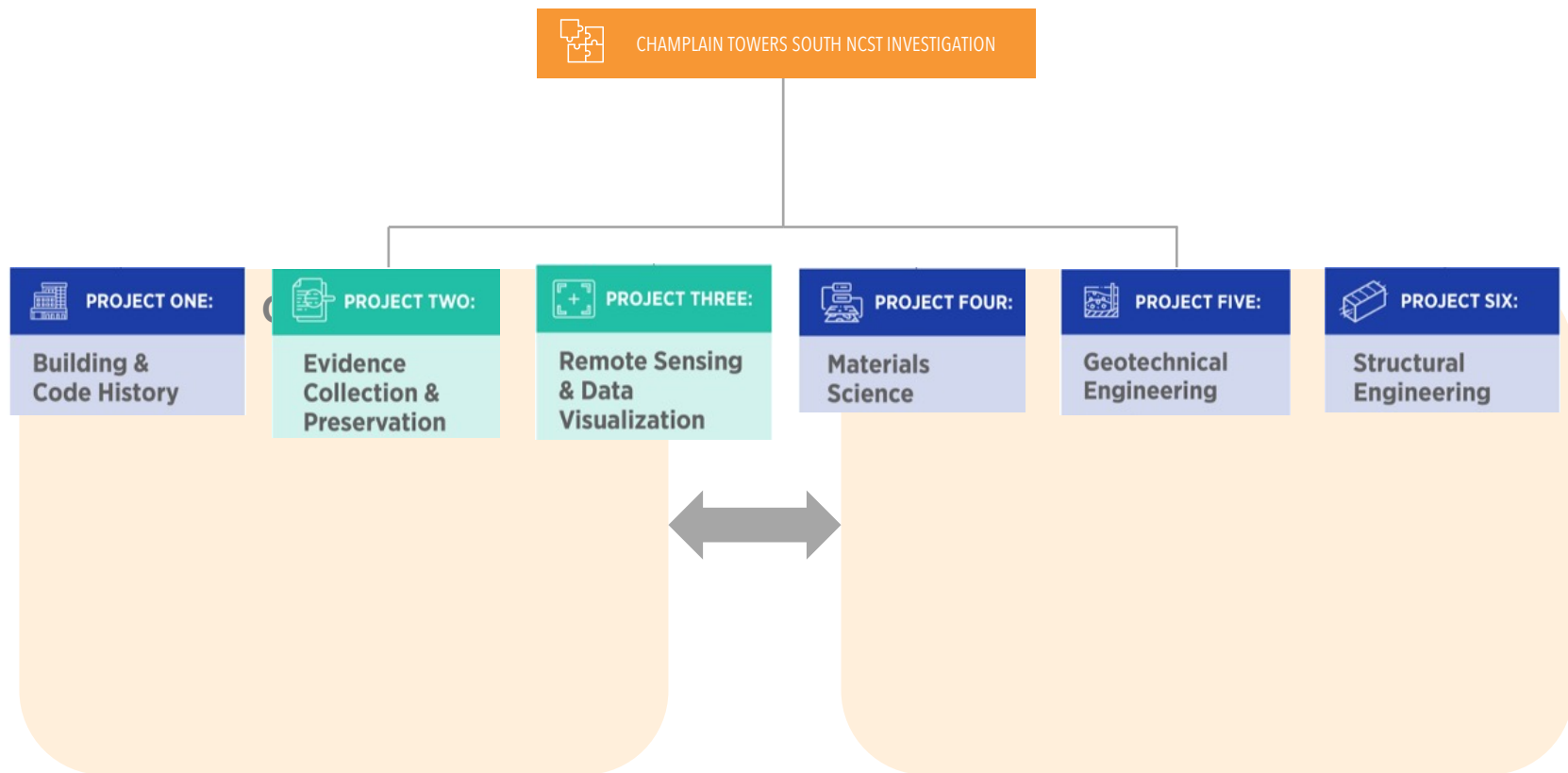
## Champlain Towers South NCST Investigation Leaders



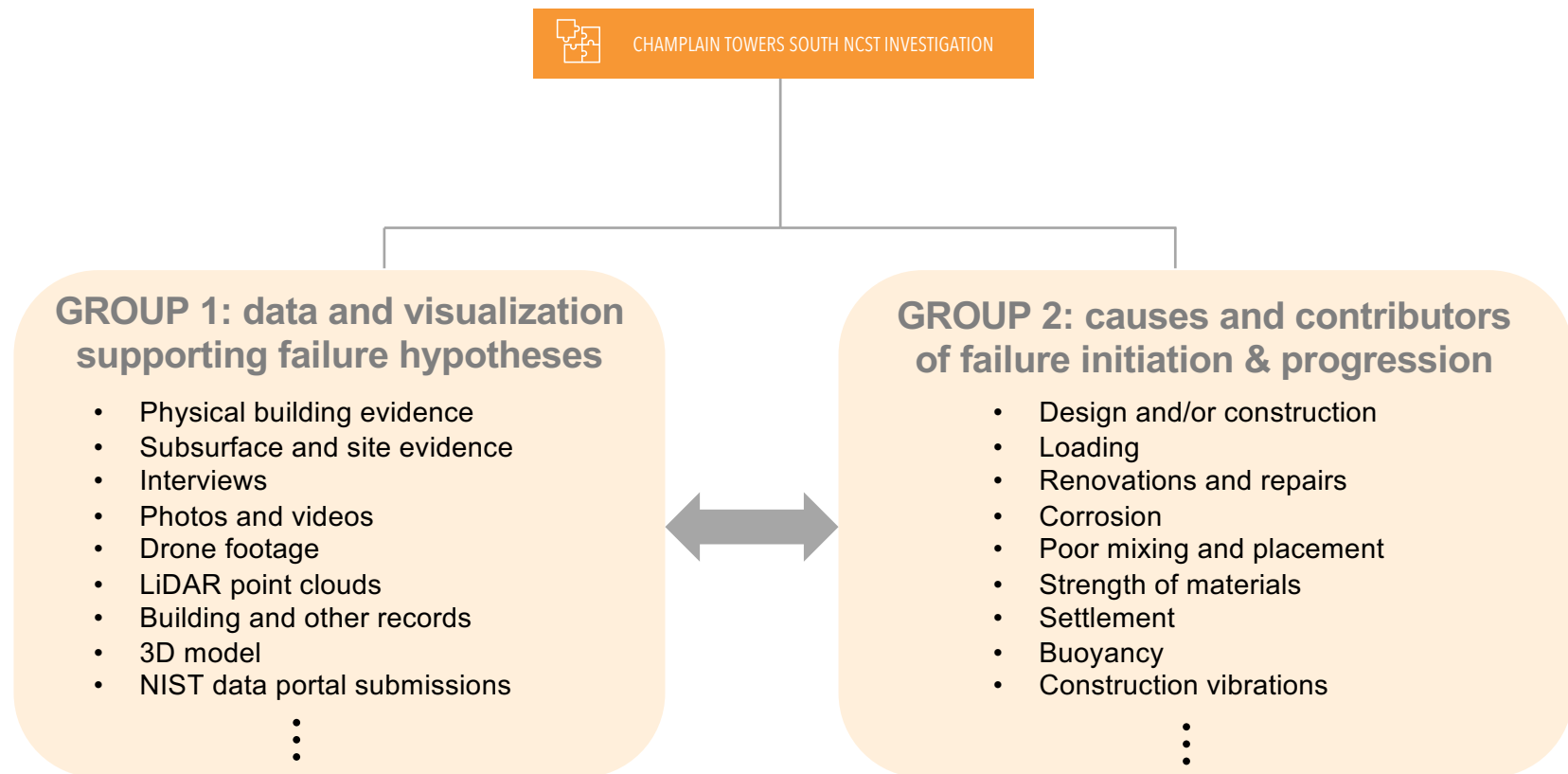
# Organization of CTS Team: Focused on Failure Hypotheses



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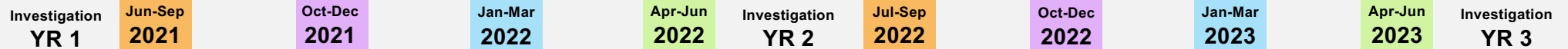
# CTS Investigation: Years 1-2 Activities



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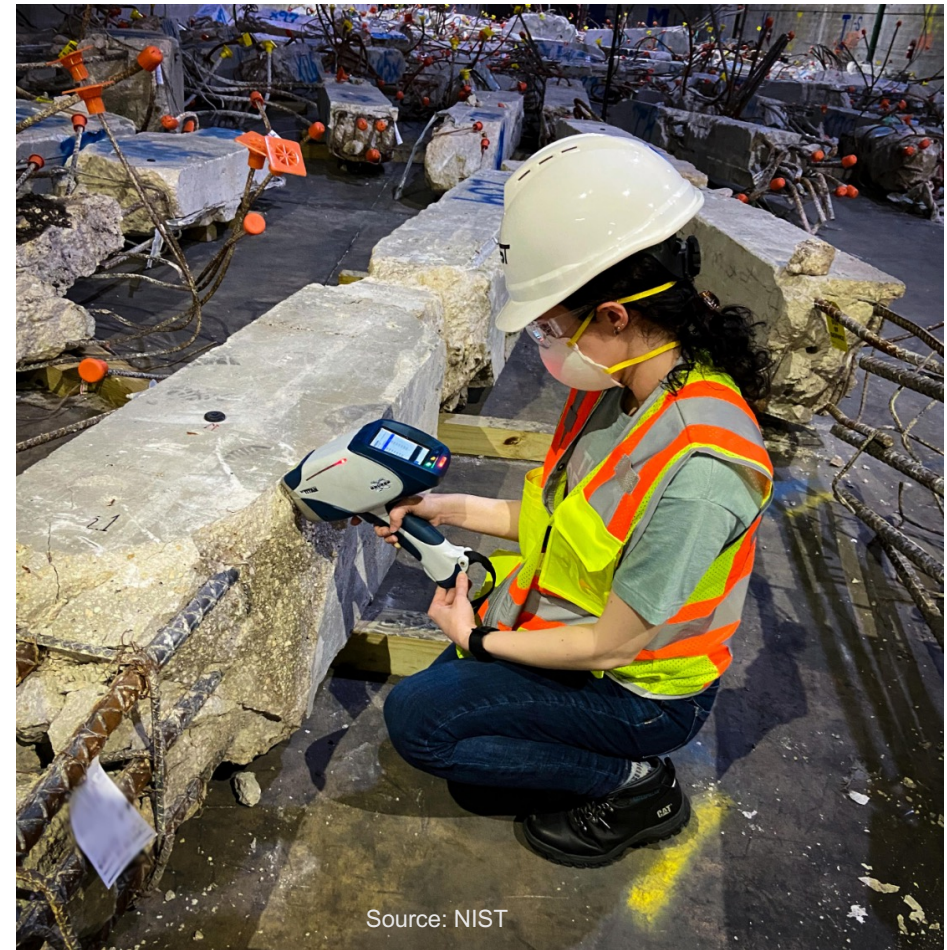
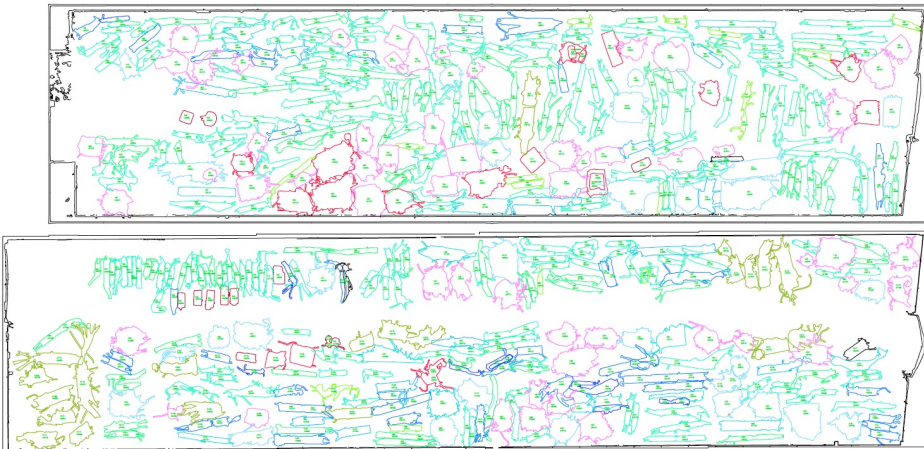
- Held NCST AC Meeting
- Attended Family Meeting
- Awarded Code Checks Contract
- Acquired/Prepared Warehouse
- Interviewed Eyewitnesses
- Continued Records Review
- Continued Corrosion Studies
- Advanced Collapse Modeling



# CTS Investigation: October-December 2022 Activities

NIST

## Primary Evidence Facility # 1 (PEF1)

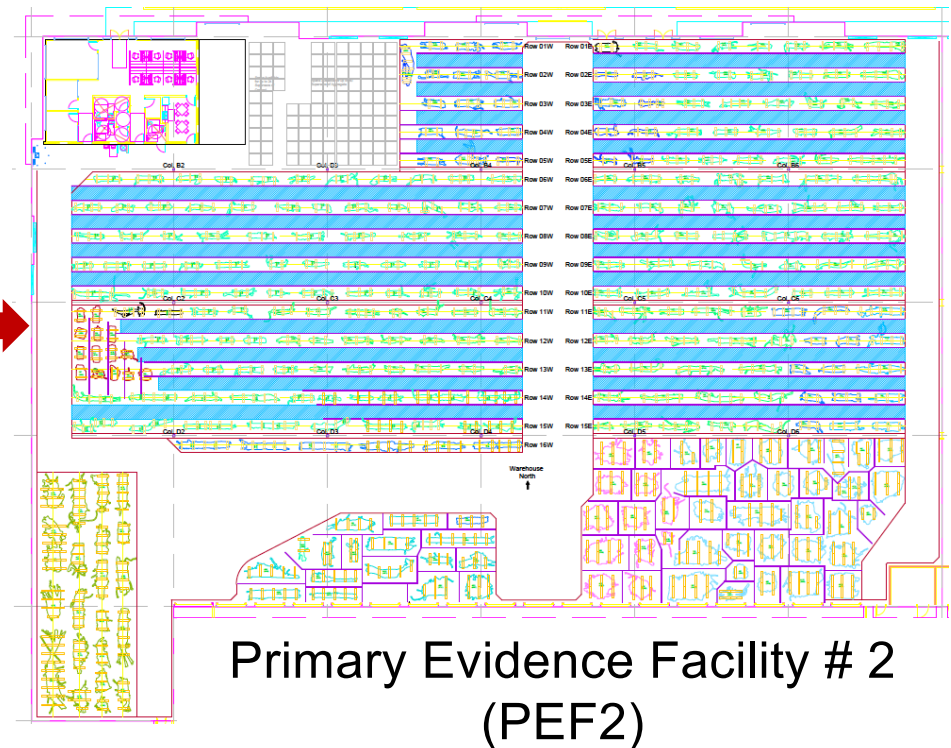
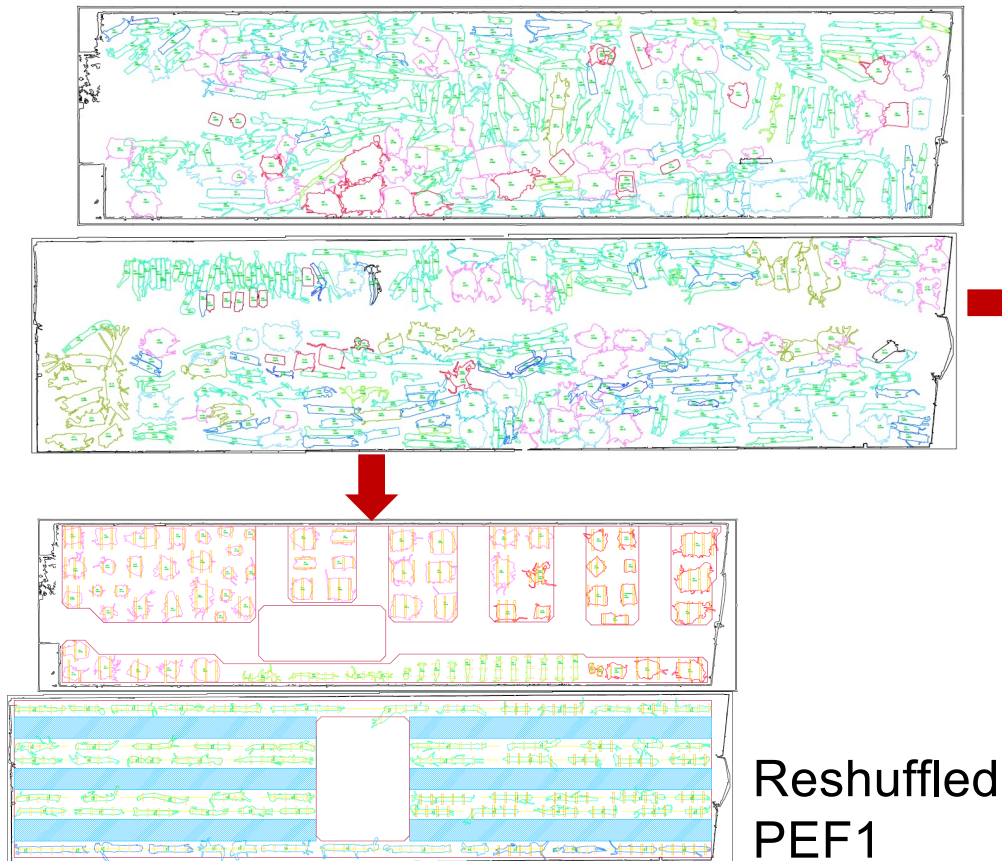




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- Participated in Competition, Pre-Bid Mtg's to Award Hauling Contract
- Searched for CTS Video Footage
- Interviewed US&R Team Members
- Awarded InSAR Contract
- Released Samples to Town of Surfside
- Recovered Additional Evidence
- Took Detailed Slab Measurements



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# CTS Investigation: January-March 2023 Activities

NIST



Source: NIST



Source: NIST

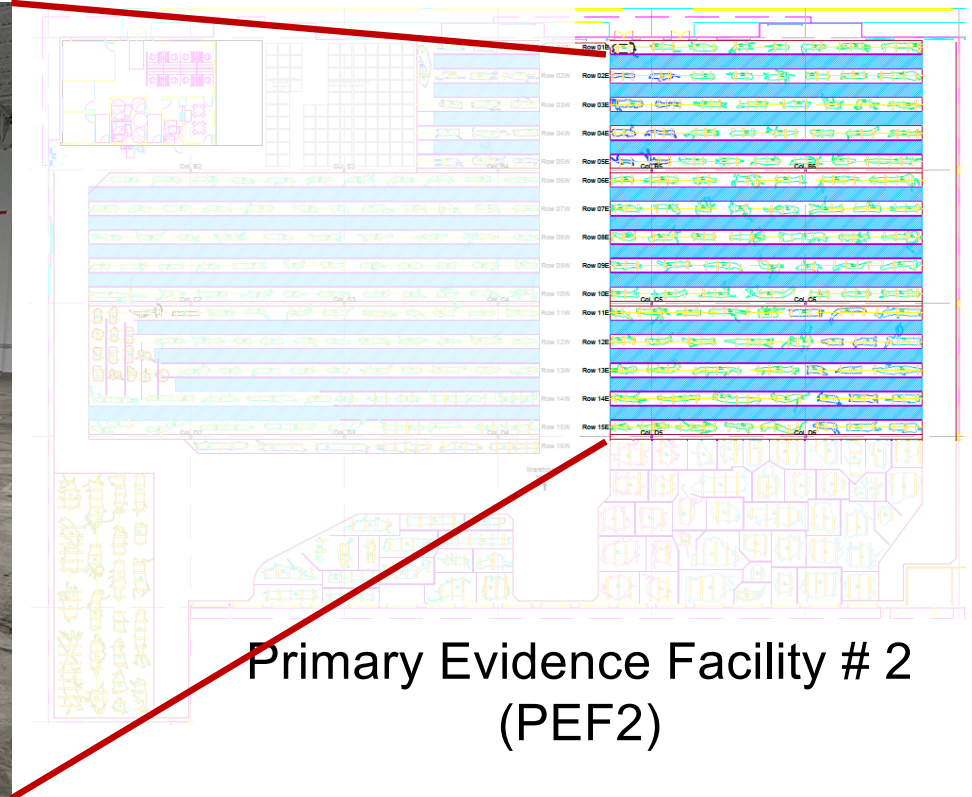


Source: NIST



# CTS Investigation: January-March 2023 Activities

NIST



# CTS Investigation: Years 1-2 Activities

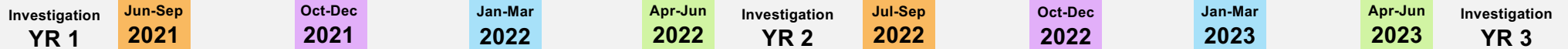


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- Refined Collapse Timeline
- Received Funding
- Developed FY22 Milestones
- Detailed Measurements
- Initial Interviews Conducted
- Held NCST AC Meeting

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- Awarded Code Checks Contract
- Acquired/Prepared Warehouse
- Interviewed Eyewitnesses
- Continued Records Review
- Continued Corrosion Studies
- Advanced Collapse Modeling

- Completed Evidence Move
- Scanned Additional Evidence
- Conducted NDT Pre- & Post-Coring
- Launched Invasive Testing
- Awarded Struct. Testing Contract
- Awarded Wind Contract
- Summarized Preliminary
- Observations from Code Checks



# CTS Investigation: April-June 2023 Activities

NIST





# CTS Investigation: April-June 2023 Activities

NIST





## **NIST Engineering Laboratory (EL)**

Structures Group (MSSD)  
Infrastructure Materials Group (MSSD)  
Earthquake Engineering Group (MSSD)  
Community Resilience Group (MSSD)  
Disaster Statutory Programs (MSSD)  
Intelligent Systems & Fire Research Divisions  
EL's Data, Security, Technology Group  
EL's Applied Economics Office

MSSD = Materials and Structural Systems Division

## **Federal**

Federal Emergency Mgmt. Agency  
U.S. Army Corps of Engineers  
U.S. Geological Survey  
National Science Foundation  
Federal Bureau of Investigation  
Department of Defense  
NOAA's National Weather Service  
Bureau of Reclamation

NOAA = National Oceanic and Atmospheric Administration

**Collaborate  
Coordinate  
Cooperate**

## **NIST**

Physical Measurement Laboratory  
Materials Measurement Laboratory  
Public Affairs Office  
Office of Chief Counsel  
Program Coordination Office  
Management and Organization Office  
Acquisition & Agreements Mgmt. Office  
ITL's Statistical Engineering Division

ITL = Information Technology Laboratory

## **Local and State**

Miami-Dade County Mayor's Office,  
Fire, Police, and Building Departments  
Town of Surfside  
City of Miami Beach  
Florida Department of Emergency Mgmt.  
Florida DOT and State Attorney's Office  
Virginia Beach Fire Department  
USAR Task Forces

DOT = Department of Transportation

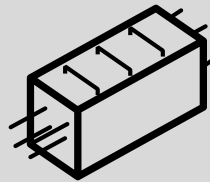
USAR= Urban Search & Rescue

# CTS Investigation: FY22-23 Overview (by the numbers)



**40+**

NIST  
EMPLOYEES



**600+**

EVIDENCE  
SPECIMENS

**78% of FY22-23  
Appropriated Funds  
Spent to Date**

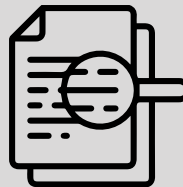
Labor: \$ 6.2M (36%)  
Other Objects\*: \$ 10.9M (64%)

*\*contracts, equipment, travel, misc.*



**15+**

LOCAL AND  
FEDERAL AGENCIES



**24+**

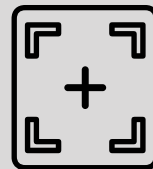
FAILURE  
HYPOTHESES

NIST's Engineering Laboratory received \$40M in additional funding through a disaster supplemental appropriation "...for the development of resilience standards with regard to weather and climate disasters, and for necessary expenses to carry out investigations of building failures pursuant to the National Construction Safety Team Act of 2002".



**20+**

WORK ORDERS AND  
CONTRACTS AWARDED



**3+ TB**

PHOTOS  
AND VIDEOS

# CTS Investigation: Public Engagement

NIST

- Working with local partner to meet with families
- Issued one news release and update since last meeting
- Released four additional videos/B-roll, photographs, live broadcast of committee meeting, and recordings of committee meeting
- Use multiple methods to communicate:



Video



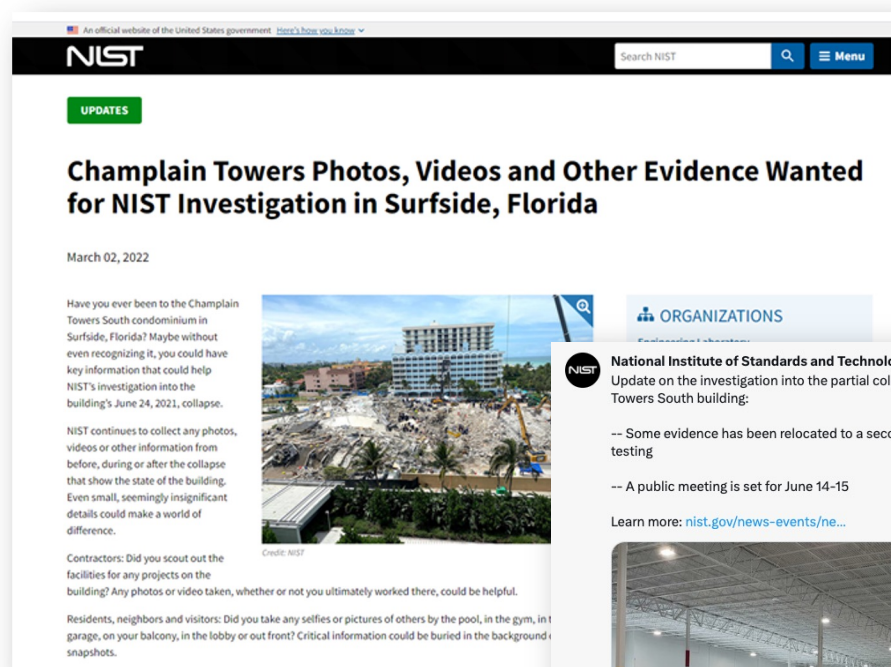
News releases



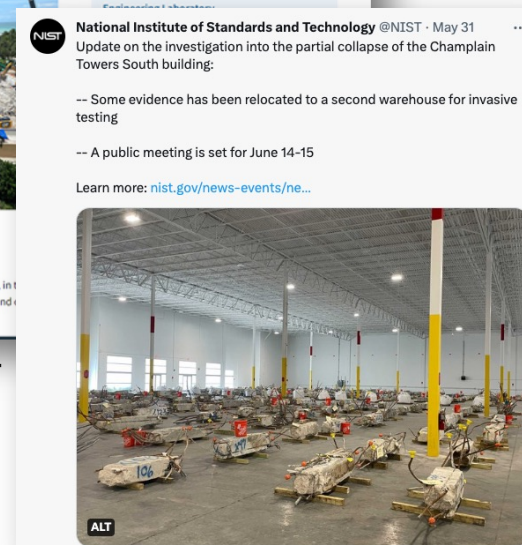
Blog



Social media



Source: NIST

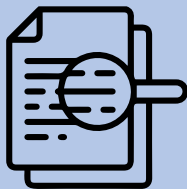


Source: NIST

# Cross-Project Themed Panels

## Theme 1:

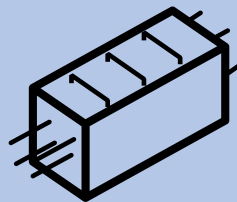
***Evidence Collection,  
Measurements, and  
Visualization***



*Sissy Nikolaou, Christopher  
Segura, Jonathan Weigand, Emel  
Ganapati, Georgette Hlepas*

## Theme 2:

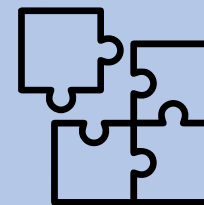
***Materials, Geotechnical,  
and Structural  
Analysis and Testing***



*Glenn Bell, Ken Hover, Scott  
Jones, Youssef Hashash,  
Fahim Sadek*

## Theme 3:

***Failure Hypotheses  
Development  
and Evaluation***



*David Goodwin, Kamel Saidi,  
Judith Mitrani-Reiser,  
Jack Moehle, James Harris*

# Outline of CTS Presentations



- ***CTS Investigation Introduction and Progress*** – Judith Mitrani-Reiser
  - Highlights of recent progress
  - Updates on stakeholder and public engagement
- ***Cross-Project Panel Theme 1: Evidence Collection, Measurements, and Visualization***
- ***Cross-Project Panel Theme 2: Materials, Geotechnical, and Structural Analysis and Testing***
- ***Cross-Project Panel Theme 3: Failure Hypotheses Development and Evaluation***
- ***Concluding Remarks and Next Steps*** – Glenn Bell
  - Preliminary evaluation of the pool deck
  - Highlights of project plans for the next 6 months
  - Investigation schedule

# Presentation of Preliminary Data & Analysis

 **IMPORTANT: ALL DATA ARE PRELIMINARY**

- These presentations describe preliminary data gathered to date as well as preliminary analyses of these data. Data and analyses are subject to change.
- Once all data are finalized and analyzed, they will inform a broader understanding of the cause of the collapse – and NIST's findings and recommendations.
- Data and analyses in these presentations should not be used to form recommendations at this time.

# NCST Investigation of the Champlain Towers South Collapse

Please stay informed via our website:  
<https://www.nist.gov/champlain>

If you have any additional information you would like to share  
about the investigation including (pictures, videos etc.), please submit them to us via:  
<https://www.nist.gov/disaster-failure-studies/data-submission-portal>